

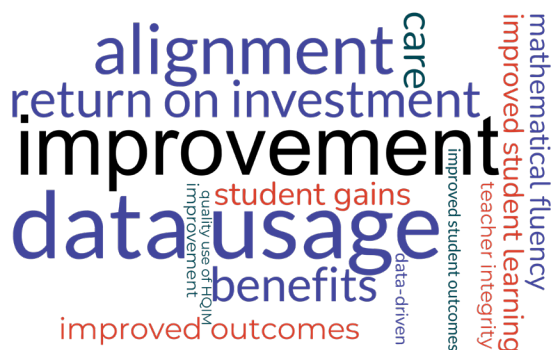
DEFINING EFFECTIVE CURRICULUM IMPLEMENTATION: INSIGHTS FROM THE EIC PROJECT

August 2025

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INTRODUCTION

The phrase “*effective implementation*” can evoke a range of interpretations depending on one’s role—whether as an educator, leader, researcher, or policymaker. Each brings a unique perspective to what it means to implement high-quality instructional materials and aligned professional learning in mathematics. Imagine posing the question, “**What does effective implementation mean to you?**” to these diverse perspectives.



The key phrases or words that the question generates for individuals often relate to math materials or curriculum and instructional practices, the intended outcomes for students and staff, as well as what it takes to produce those outcomes (e.g., professional learning, data-driven decision-making).



The Effective Implementation Cohort (EIC) project strived to answer this question about effective implementation with leaders and educators. Specifically, the EIC was designed to help school districts implement an instructional system that supports using a high-quality middle school math curriculum. The purpose

of this brief is to summarize key learnings on what districts need to have in place for effective implementation—the core features or components of implementation.

EIC aims to:

- Increase districts’ capacity to implement a high-quality middle-grade math curriculum to accelerate learning for students experiencing poverty and Black, Latino/a, and/or English Learner (EL)-Designated students
- Learn and share with larger education community what districts need to have in place for effective implementation, what aspects of implementation at the district and school level most benefit priority students, and the work involved in making site-wide implementation successful.

This output is organized into the three components of effective implementation practice, conceptually rooted in the National Implementation Research Network's Formula for Success:



Mathematical Practices



Implementation Processes



Contextual Considerations

For each component, key features associated with the component are described and defined. In addition, rationales and evidence supporting their importance are provided as well as examples or illustrations of features in action from evidence generated in the EIC project. Rationales were generated based on existing literature as well as various quantitative and qualitative data collected in the EIC, including teacher surveys and interviews/focus groups with professional learning providers, district leaders, and instructional coaches. Examples/illustrations of the core features in action were produced based on the work conducted within EIC. This work was framed based on several assumptions, including:

- Math instructional practices and materials being supported for use were usable (i.e., defined well enough to be teachable, learnable, doable, and measurable in practice; Fixsen & Blase, 2020).
- Professional learning services provided by Professional Learning (PL) Providers paired with each district were ongoing (sustained engagement), of high-quality, and addressed knowledge and skills of math content, math instructional practices, and leadership for implementation.
- Participating local education agencies (LEAs) were at the beginning of their implementation journey. Most participating LEAs were in years 0-3 of their math curriculum and instructional vision implementation.



COMPONENT 1

THE MATHEMATICAL PRACTICES, OR THE “WHAT?”

What are “mathematical practices”?

Mathematical practices refer to the instructional practices and materials being used within implementation. Specifically, the practices refer to the actions and behaviors that instructional staff exhibit when delivering instruction and utilizing the materials. There are several key features of the mathematical practices for implementation.

These include:

- Strength of the evidence for the practice’s effectiveness
- Usability of the practice
- Perceived relative advantage or disadvantage of the practice over other practices/ solutions or status quo by implementers
- Perceived adaptability of the practice to meet local needs by implementers
- Perceived complexity of the practice to use by implementers
- Perceived trialability of the practice by implementers (i.e., can test its use)

What types of mathematical practices were used in the EIC?

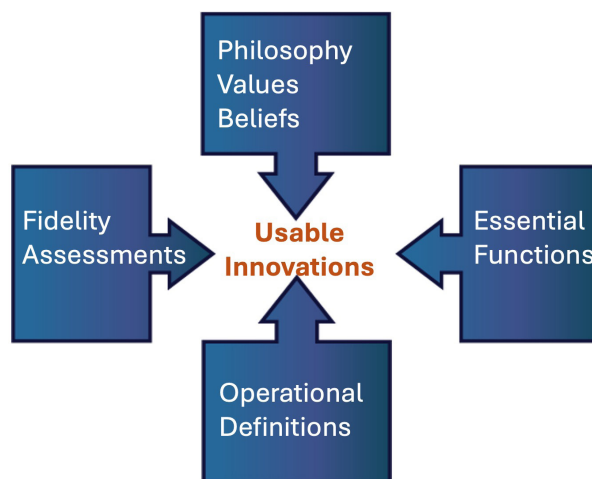
Various mathematical practices and curricula were being used across the 19 school districts in the EIC. The curricula included those such as Agile Mind, EngageNY (original version of Eureka Math), Eureka Math2, iReady Math, Texas Go Math, Illustrative Mathematics (IM), and IM derivative Open Up Resources. In terms of math instructional practices, they included practices such as problem-based learning, student discourse and collaboration, and routines.

The strength of the evidence for the practice’s effectiveness can be demonstrated within research and development as well as within local implementation efforts. For the EIC project, all but one of the curriculum or instructional materials used were designated as high-quality by EdReports. Specifically, the various curricula being used received the highest ratings in EdReports’ independent review process for focus and coherence (e.g., alignment to standards, focus on right content at proper depth and progress logistically), rigor and use of instructional practices in mathematics (e.g., balance of conceptual understanding, fluency, and application and integration of practices), and the available implementation supports and feasibility (e.g., teacher and student friendly, support diverse learners). To learn more about how these curricula were selected by the EIC districts, see the [Processes for Selecting a High Quality Mathematics Curriculum](#) brief.

Having evidence of effectiveness is not sufficient for implementation; the practices must also be usable (Figure 1). For the practices to be usable, several criteria are identified: 1) clear description of the practice’s underlying pedagogy, values, and principles, and criteria for who it is meant for (e.g., middle school students); 2) clear description of the essential functions that must be present for intended outcomes—also known as the active ingredients; 3) operational definitions of the essential functions in use; and 4) a practical assessment or measure of the practice in use by the instructional staff (Fixsen & Blase, 2020).

Within the EIC, many of the districts and their professional learning (PL) providers worked to ensure alignment between selected mathematical practices and materials with their instructional vision, prioritizing practices for implementation that were clearly defined. They documented

Figure 1. Usable Innovations



their instructional vision, inclusive of their philosophy and pedagogy, within their implementation plan. District teams, with their PL providers' support, ensured that clear descriptions and operationalized definitions of the essential functions were captured in their professional development materials. Others also provided implementation tools (e.g., implementation guides). A criterion of usable practice that was challenging for EIC districts to ensure was the presence and use of a practical assessment or measure of the selected practice, which is often referred to as an integrity or fidelity assessment. The lack of a standardized and robust adherence assessment tool used across EIC districts hindered the meaningful collection of fidelity data.

Why are mathematical practices a component of effective implementation?

BASED ON THE LITERATURE

A practice is often assumed to be usable; however, practices often do not meet all four criteria of a usable innovation, which can cause challenges in implementation.

Rationales for having well-defined operational practices include the following within the research literature:

- more likely to use the practices with quality and integrity (Century et al., 2010)
- facilitates spread and replication of the practices within additional classrooms and schools (Ryan et al., 2024)
- enables improvements to be identified and acted upon (Moir, 2018; Fixsen & Blase, 2020)
- supports accurate interpretations of outcomes (Moir, 2018)
- creates a shared language and deeper understanding (IRIS, 2025)

BASED ON EIC DATA

Based on the limited available data, EIC districts demonstrated some improvement in the fidelity or integrity of the curriculum materials and instructional practices (e.g., 5% improvement in the number of teachers demonstrating a high level of fidelity from year 2 to year 3).

Over time, instructional staff consistently reported high levels of perceived feasibility, acceptability, and appropriateness (fit) of their instructional materials. Within interviews with teachers, feasibility, in particular, was identified as a key factor for gaining teacher buy-in and promoting teacher engagement.

Based on the focus groups conducted with professional learning providers, district leaders, and staff, conducting peer-to-peer observations and conducting classroom observations or learning walks using an integrity or fidelity assessment was identified as critical to deepening teachers', instructional coaches', and leaders' understanding of the instructional practices and materials. In addition, the observation data were used to drive improvements in professional learning services, other implementation supports such as communication and data use for improvement, and use of the instructional practices.

“

“Well, we created an implementation reflection tool that we adapted from [curriculum]. And so that’s the data that we use when we go into the classrooms and we look at student learning behaviors, and we look at what teacher actions are, and then, of course, we look at if math learning routines and other instruction routines are used. And that data help drive what we are going to present in our PDs if we’re seeing more or less of it.”

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COMPONENT 2

THE IMPLEMENTATION PROCESS, OR THE “HOW?”

What is the “implementation process”?

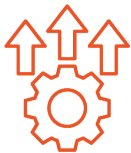
Effective implementation requires use of a step-by-step, structured implementation practice process, including specific strategies designed to guide implementation teams. In education, this multi-year team-based process typically involves district leadership, school leadership, instruction staff, students and their caregivers, and external partners. The steps in this process span different implementation stages, from exploration to full implementation (Aarons et al., 2011; Fixsen & Blase, 2020). A description of the EIC implementation journey across LEAs is described here: [Effective Implementation of High-Quality Math Curriculum and Instruction](#).

Implementation strategies can be defined as the “how to” of implementation, or the methods and actions by which each of the steps are achieved. Implementation strategies are typically identified and clustered based on the Expert Recommendations for Implementation Change (ERIC) classification (Powell et al., 2015). The strategy clusters were used and adapted by the EIC team based on the information obtained by surveying the 19 district-provider dyads, and conducting five focus groups with districts and providers. The analysis produced seven strategy clusters, all of which were further themed into specific strategies by the EIC team based on the literature and seemed to impact implementation success. For details on the lessons learned related to the EIC strategies, see here: [Implementation Strategies for Systems Change: Insights and Lessons Learned](#).

What were the EIC strategies?



Cultivating relationships, champions, and leadership involved: (1) the identification of multiple sponsors and champions at different levels of the system, with authority and capital to promote the curriculum vision and adoption process; (2) the development of implementation teams representative of involved staff, organizations, and the community to lead and support the adoption of the curriculum; and (3) the development of partnerships between school districts and PL providers responsible for supporting implementation efforts of the curriculum.



Facilitating curriculum integration was accomplished through: (1) effectively navigating politics and priorities (e.g., adoption of a shared vision, alignment of priorities, creating a shared understanding among key players); (2) preparing a communication plan including messaging across and outside of the system; and (3) tailoring and adapting support strategies based on data and context.



Engaging students and families in the adoption process involved incorporating student feedback and experience with the curriculum, forming student council groups, and using data on student engagement to encourage teacher buy-in and motivation.



Data-driven decision making was driven by strategies related to data design/development, data collection, and data analysis/reporting. In the EIC project, examples of data design strategies included: ensuring alignment of goals with data types and methods; the need to take a team approach to the measurement plan development; the importance of considering different sources of data to strengthen the validity of results; and selecting measurement approaches that were actionable. Examples of data collection strategies involved incorporating cycles of learning and improvements, and having teachers and administrators observe curriculum implementation across classrooms and schools. Finally, the importance of taking time to make sense of the data, create meaningful data stories, and tailor messaging to the targeted audiences were emphasized as critical data analysis and reporting strategies.



Allocating resources and financial incentives was operationalized differently across LEAs. While some concluded that offering incentives across the board was either insufficient or not effective, others noted that focusing specifically on incentivizing teacher leads or data collection efforts worked well. Regardless, understanding and carefully planning for adequate resource allocation (e.g., number of coaches needed to support teachers, union rules for incentivizing teachers) was highlighted as a strategy to avoid later challenges.



Setting up a structured, system-wide, multi-level, integrated implementation infrastructure, with clearly defined roles and responsibilities, linked teaming arrangements, and implementation plans, was critical to implementation success.



Receiving implementation support to facilitate implementation of the curriculum was operationalized through diverse support delivery models (see [Deep Dive](#) into the delivery models below). The four implementation support strategies utilized included provision of: (1) professional learning and training to school leadership, administrators, and teachers; (2) coaching to school leaders and teachers; (3) opportunities for school leaders, administrators, teachers, coaches, and others to learn together through communities of learning and cross-campus walkthroughs; and (4) tools, resources, and written materials to support both understanding of the curriculum and how to implement it.

Why is a structured implementation process one component of effective implementation?

BASED ON THE LITERATURE

Employing multiple, well-defined strategies—such as training and educating stakeholders, iterative evaluation, and developing strong stakeholder relationships—significantly enhances fidelity, acceptability, feasibility, and adoption of interventions

in schools (Baffsky et al., 2023; Moore et al., 2021; Wolfenden et al., 2022). Systematic reviews of the literature also support the use of implementation strategies for substantial improvements in the uptake of evidence-based practices and, to a lesser extent, in student outcomes (usually significant for more proximal curricular-specific measures than general achievement scores) (Brafford et al., 2023; Rojas-Andrade & Bahamondes, 2019).

BASED ON EIC DATA

All of the implementation strategies identified were rated highly across the 19 district-provider dyads (N=120) in terms of both effectiveness and quality. Examination of implementation plan data related to the strategies trended in the positive direction, with plans reflecting greater comprehensiveness of strategies over the three years. As a result of five focus groups with PL providers and district staff, a number of perceived impacts were identified at all levels of the system (students, teachers, administrators, systems and structures, and sustainability efforts). Examples included: increased student engagement with math, changed mindsets related to math instruction, enhanced connections within and across schools, and increased commitment and systems changes to sustain the curriculum over time.



"The biggest potential for impact is district implementation and systems change work which is the hardest to move."



Finally, based on the EIC quantitative models, the higher the quality and effectiveness of strategies, the greater the district implementation capacity and the higher the levels of implementation quality (based on district-level teacher acceptability, appropriateness, and self-efficacy for math instruction). In other words, strategies impacted implementation quality.

DEEP DIVE

IMPLEMENTATION DELIVERY MODELS

PL providers for each district supported the use of these various implementation strategies. Their implementation delivery support models varied extensively in terms of who received the support, how much support was provided, and the focus of support. A sample of three delivery models below highlights this variability. When planning supports for implementation, it is critical to select a PL provider who can tailor their services and approach to the needs and readiness of the district (see [Provider Selection Guidance tool](#)).

Three delivery model examples:

1. PL Provider Responsible for Implementation Supports
2. PL Provider Supports Implementation Planning & District Facilitators
Provide Professional Learning
3. PL Provider & Curriculum Provider Co-Support Implementation for
Multiple Roles within Implementation

EXAMPLE 1: PL PROVIDER RESPONSIBLE FOR IMPLEMENTATION SUPPORTS

In this first example, the PL provider was responsible for many of the implementation strategies being used, including planning the implementation processes, providing professional learning (e.g., math training, data use training) and coaching supports to instructional coaches, and supporting observations of math practices and materials in use with coaches. Math teachers then received support directly from district coaches.

HQMC

Illustrative Math

Implementation

Start Date

At the start of EIC

Location- Suburban

< 19,000 K-12 students

4 middle schools

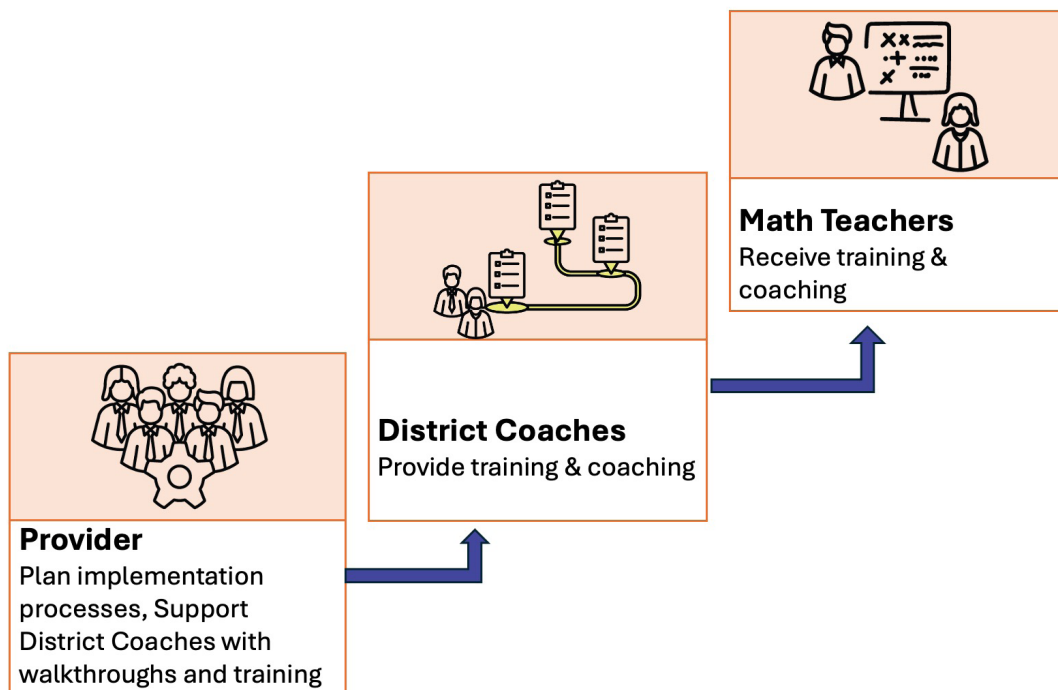
Leadership Stability

- Superintendent
- Changes on the Provider side

Implementation Team Members

- PL providers
- Curriculum Program Specialist, Language Support Services
- Curriculum Program Specialist Secondary Mathematics
- MS Math Teacher
- Union Representative/ MS Math Teacher
- MS Assistant Principal / MS Principal

Diagram of Example 1



EXAMPLE 2: PL PROVIDER SUPPORTS IMPLEMENTATION PLANNING & DISTRICT FACILITATORS PROVIDE PROFESSIONAL LEARNING

In this second example, the PL provider supported the LEA implementation team with implementation planning using data. They also provided professional learning directly to the District's Academic Planning facilitators. Those facilitators are then responsible for providing teachers with math training and group coaching supports. This example highlights the use of a "cascade" approach and use of group coaching strategy.

HQMC

Eureka Math

Implementation

Start Date

5 years prior to EIC

Location-Urban

> 50,000 K-12 students

> 20 of middle schools (including PK-8 and middle/high)

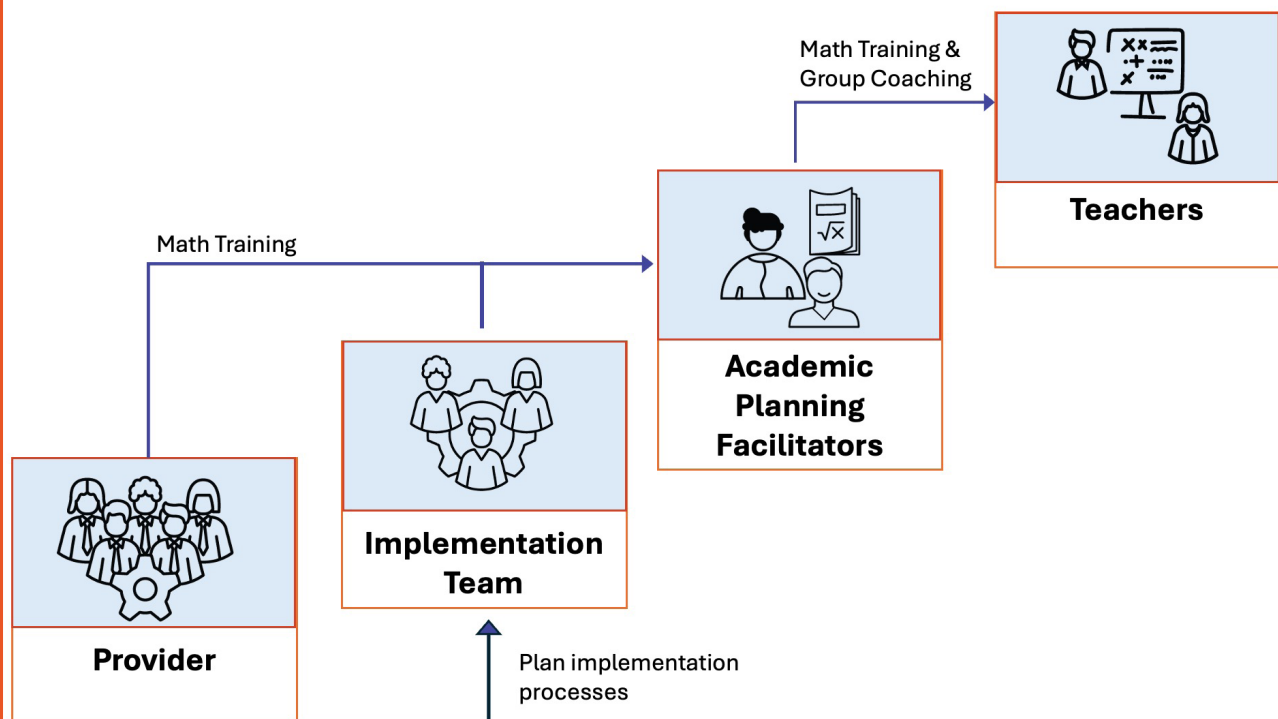
Leadership Stability

Superintendent

Implementation Team Members

- Director of Mathematics
- Education Specialists
- Academic Content Liaisons
- Special Education Liaison
- Program Manager
- Leading Educators Director of Content
- Leading Educators Assoc. Director of Networks
- Leading Educators Instructional Leadership Coach
- Leading Educators Program Director
- Leading Educators Director Content

Diagram of Example 2



EXAMPLE 3: PL PROVIDER & CURRICULUM PROVIDER CO-SUPPORT IMPLEMENTATION FOR MULTIPLE ROLES WITHIN IMPLEMENTATION

The final example illustrates a more complex model of implementation support. Both a PL Provider and curriculum provider worked together to support the district's secondary math team that provided governance for the math initiative, a smaller subset of that team responsible for day-to-day implementation, and the math instructional coaches. Principals were also supported by the PL provider in terms of implementation leadership. In this support model, multiple roles within the implementation process were supported in their use of implementation strategies. For example, in the diagram below communication feedback loops were a common practice across all participants.

HQMC

Year 21-23 IM
Year 23-24 the district deselected and allowed buildings to choose their curriculum

Implementation Start Date

At the start of EIC

Location- Urban

< 50,000 K-12 students
28 middle schools

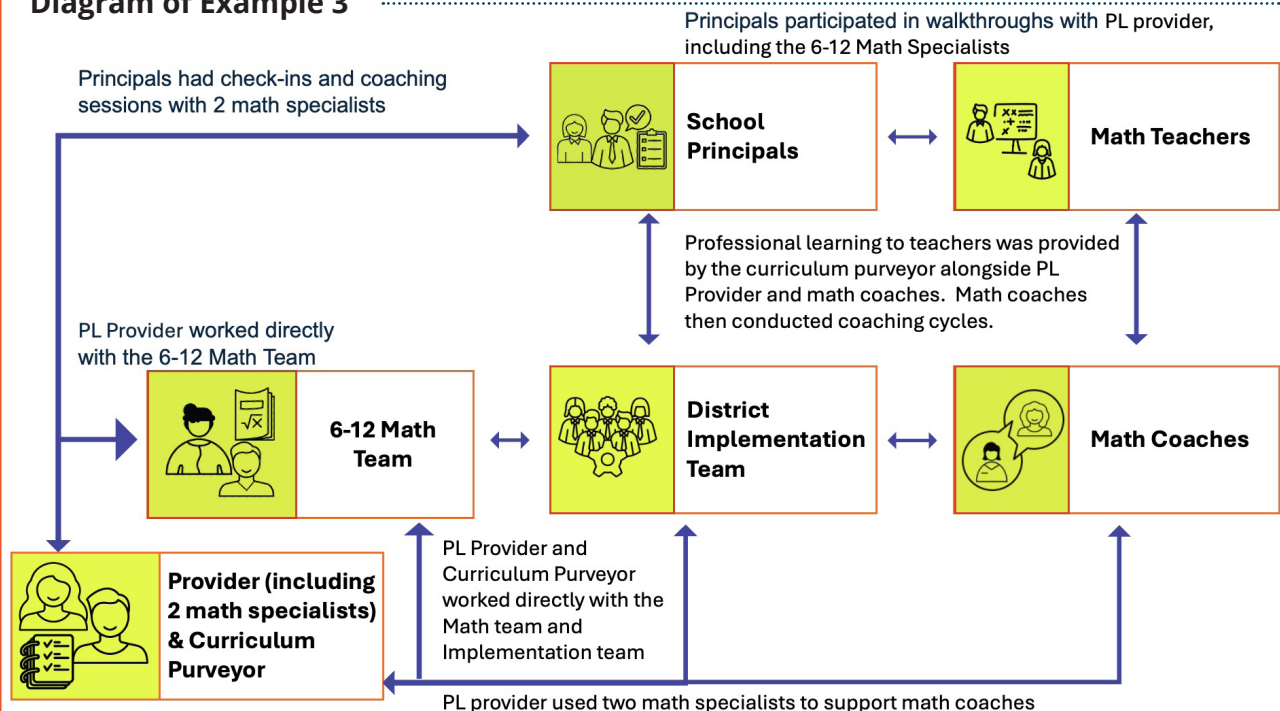
Leadership Stability

Superintendent

Implementation Team Members

- Assistant Superintendent of Teaching and Learning
- Executive Director of Curriculum and Instruction
- Director of Secondary Curriculum and instruction
- 6-12 Math Coordinator
- 6-12 Math Specialists (2)
- Coordinator of instructional development and design
- Program director for school support
- Associate superintendent of schools
- Principals (5)
- Assistant Principals (3)
- Instructional coach (2)
- System Partner
- Amplify Representative
- Executive Director of data and information
- NIRN

Diagram of Example 3





COMPONENT 3

THE CONTEXTUAL CONSIDERATIONS

What are “contextual considerations”?

Context matters. Based on the Context and Implementation of Complex Interventions (CICI) framework, context is defined as “a set of characteristics and circumstances that consist of active and unique factors, within which the implementation is embedded. As such, context is not a backdrop for implementation, but interacts, influences, modifies, and facilitates or constrains the intervention and its implementation” (Pfadenhauer et al., 2017; p. 4). As the third component of effective implementation, context interacts with the intervention (i.e., math curriculum) and the implementation process to create an environment that supports successful implementation. In the EIC project, the three main types of context included political, community, organizational/ learning contexts. The readiness factors impacting each of these contexts are described here: [Context-Specific Readiness Factors to Consider for Implementation of a Curriculum](#). Each of these types of context are defined in more detail below based on Damschroder et al. (2022) and Pfadenhauer et al.’s (2017) frameworks.

What types of contexts were considered in the EIC project?



The **political or socio-political context** referred to the set of actions or dispositions associated with decision-making in groups and other power-related activities among individuals. In the context of EIC, it was critical to ensure alignment of the need for improvement in math with the board of education’s and other governing entities’ priorities. Of equal importance was a review and establishment of enabling supports for implementation.



The **community context** was defined as the set of connected values, beliefs, history, culture, socio-economic status, and relationships among members of the local community. Considering the community context meant exploring and aligning the curriculum to the community needs and values, identifying strategies for involving families and caregivers, and collaborating with organizations supporting the adoption of the curriculum.



The **organizational/learning context** involved the educational system’s (i.e., schools, districts) general values, culture, and infrastructure, as well as its capacity to successfully adopt and implement the curriculum. EIC examples of attending to the organizational/learning context included: the schools’ and districts’ prioritization of math improvements based on their vision and goals; a focus on organizational values such as teamwork, improvement, and collaboration; reflecting on leadership stability; and a commitment to use of data for improvement purposes.

Why are contextual considerations a component of effective implementation?

BASED ON THE LITERATURE

Effective implementation of a curriculum is influenced by policy coherence—meaning the alignment between policy intentions, curriculum content, and school practices—, leadership, and decision-maker involvement (Pak et al., 2020).



When policymakers, school leaders, and other stakeholders share a coherent understanding of reform goals and strategies, curriculum changes are more likely to take root and have a positive impact on school development (Bros & Schechter, 2022; Honig & Hatch, 2004).



The community context shapes curriculum success through cultural alignment, stakeholder engagement, and responsiveness to local needs—curricula that are adapted to reflect community values and involve parents and local leaders tend to see higher engagement and better outcomes (Mpuangnan & Ntombela, 2023). Studies also highlight that a mismatch between curriculum content and the realities of students' lives or community priorities can lead to low fidelity and poor outcomes, especially in vulnerable or under-resourced schools (McKenna et al., 2014; McKenna & Parenti, 2017).



School-specific organizational factors such as leadership (including distributed leadership), implementation climate (focus on and support for evidence-based practices), and citizenship behaviors (helping others, information sharing, feedback) also play a role in effective implementation (Locke et al., 2018).

BASED ON EIC DATA

Although the broader **political context** was not specifically evaluated as a variable, the capacity to navigate politics at different levels of the educational system and alignment of the curriculum with governing entities were identified repeatedly as a facilitator of effective implementation in the focus groups conducted with district staff and providers over the project years.

The importance of **community context**, i.e., aligning the curriculum with the students' realities, was reflected in the findings on student demographics and teacher implementation variables. Based on EIC data, the associations between teacher factors (e.g., teacher self-efficacy, acceptability) and student outcomes differed across groups of priority students. For instance, teachers' self-efficacy for math instruction had a positive effect on enjoyment for White, Black, and Asian students, but no effect for Hispanic students or students who identified as another race.

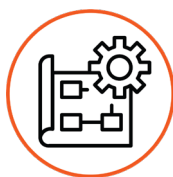
Finally, the role of the **organizational/learning context** in effective implementation was supported by EIC findings. Both greater implementation capacity at the district level and higher implementation team functioning over time trended positively with increases in implementation quality (e.g., acceptability of the curriculum, appropriateness of the curriculum, self-efficacy for math instruction, and self-efficacy for cultural pedagogy). Barriers to implementation identified by district staff and providers included organizational factors such as the importance of involving those affected by the curriculum in its adoption, staff initiative fatigue, challenges with turnover, leadership stability, and resource availability.

IN SUMMARY

Educators each bring a unique perspective to what it means to effectively implement high-quality instructional materials and aligned professional learning in mathematics. Every implementation is going to look different because context matters. The key is to ensure the core components of effective implementation are intentionally planned for and systematically improved using data.



**Mathematical
Practices**



**Implementation
Processes**



**Contextual
Considerations**

Check out the [Effective Implementation of High Quality Instructional Materials](#) planning tool to guide intentional planning for ensuring all three components of effective implementation are addressed.

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